

Name: \_\_\_\_\_

## at1118paper: Complete the Square (v406)

### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 32x = -252$$

Add  $\left(\frac{-32}{2}\right)^2$ , which equals 256, to both sides of the equation.

$$x^2 - 32x + 256 = 4$$

Factor the left side.

$$(x - 16)^2 = 4$$

Undo the squaring. We need to consider both  $\pm\sqrt{4}$ .

$$\begin{aligned} x - 16 &= -2 \\ x &= -18 \end{aligned}$$

or  
or

$$\begin{aligned} x - 16 &= 2 \\ x &= -14 \end{aligned}$$

### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 28x = -187$$

$$x^2 - 28x + 196 = 9$$

$$(x - 14)^2 = 9$$

$$x - 14 = \pm 3$$

$$x = 11 \quad \text{or} \quad x = 17$$

### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 52x = 1088$$

$$x^2 - 52x + 676 = 1764$$

$$(x - 26)^2 = 1764$$

$$x - 26 = \pm 42$$

$$x = -16 \quad \text{or} \quad x = 68$$

### Question 3

By completing the square, find both solutions to the given equation:

$$x^2 - 6x = 475$$

$$x^2 - 6x + 9 = 484$$

$$(x - 3)^2 = 484$$

$$x - 3 = \pm 22$$

$$x = -19 \quad \text{or} \quad x = 25$$

### Question 4

By completing the square, find both solutions to the given equation:

$$x^2 - 24x = -95$$

$$x^2 - 24x + 144 = 49$$

$$(x - 12)^2 = 49$$

$$x - 12 = \pm 7$$

$$x = 5 \quad \text{or} \quad x = 19$$

### Question 5

By completing the square, find both solutions to the given equation:

$$x^2 + 22x = 720$$

$$x^2 + 22x + 121 = 841$$

$$(x + 11)^2 = 841$$

$$x + 11 = \pm 29$$

$$x = -40 \quad \text{or} \quad x = 18$$

### Question 6

By completing the square, find both solutions to the given equation:

$$x^2 + 44x = -403$$

$$x^2 + 44x + 484 = 81$$

$$(x + 22)^2 = 81$$

$$x + 22 = \pm 9$$

$$x = -31 \quad \text{or} \quad x = -13$$